

PATENT ABSTRACTS OF JAPAN

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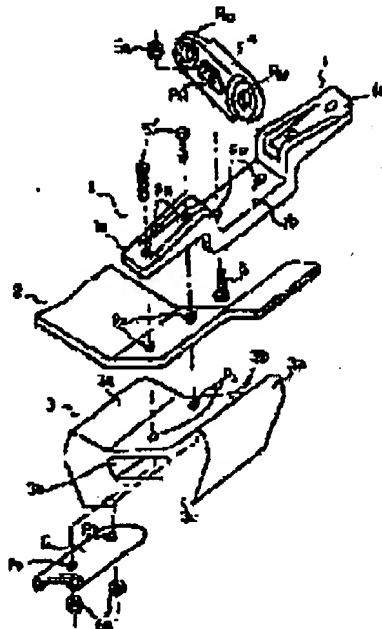
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(22)Date of filing : 30.04.1993 (72)Inventor : KATO YUSAKU

(54) CONNECTING LINK TYPE RUBBER CRAWLER

(57)Abstract:

PURPOSE: To change a damaged component alone and to prolong the extent of durable life as well as to facilitate a job for setting operations by manufacturing a core, a rubber belt body and a rubber pad body separately, and using them after being assembled together.

CONSTITUTION: Two track links 4 and 4 for paired steel crawlers are adjusted to two bolt holes P41 and P12 and clamped to both upper sides of a central part 1b of a core 1 by a bolt 5 and a nut 5a. In addition, both ends of these track links 4, 4 are superposed on, and connected to each other and further formed into an endless body, and each core 1 is arranged in a line at a specified interval downwards the track links 4 connected this like. In succession, two rubber belts 2 and 2 and rubber pads 3 and 3 inserted with a patch 6 in a horizontal cave 3h are adjusted to four bolt holes P11, P2, P3 and P4 and clamped by a bolt 5' and a nut 5'a and assembled for application.



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CLAIMS

[Claim(s)]

[Claim 1] The connecting linkage type rubber crawler characterized by considering as the configuration which attached the rubber slab object in each of this rodging vane through the rubber belt object which follows a hoop direction under the both-wings section of each rodging which carries out polymerization connection of the both ends of each track link mutually, and is arranged at fixed spacing under an endless object, nothing, and the connected this track link while attaching the track link for the iron crawlers of a pair in the upper part both sides of the center section of much rodging.

[Claim 2] In order that the above-mentioned rodging may serve as the shape of the shape of flat, the made right-and-left vane, and a cavity from the made center section mostly and may attach the above-mentioned track link in the both sides of this center section in a connecting linkage type rubber crawler according to claim 1, For attaching a rubber slab object in each of a right-and-left vane through the above-mentioned rubber belt object, each And nothing [which established installation means, such as a bolthole, / the configuration and nothing], Nothing [which formed installation means, such as a bolthole for attaching in the above-mentioned rodging vane, in the predetermined location while forming the above-mentioned rubber belt object in the die length which follows the hoop direction of the above-mentioned endless object as thin comparatively / the configuration and nothing], Nothing [which formed installation means, such as a bolthole for attaching in the above-mentioned rodging vane through the above-mentioned rubber belt object, in the top face while the above-mentioned rubber slab object formed the touch-down lug section caudad / the configuration and nothing], **, and attach each above-mentioned track link, rodging, a rubber belt object, and a rubber slab object in one with each installation means, and it is made to join together. The connecting linkage type rubber crawler characterized by considering as the configuration equipped with the touch-down lug section arranged at fixed spacing at the both sides by the side of a periphery while having the track link with which a pair follows the central both sides by the side of inner circumference.

[Claim 3] The connecting linkage type rubber crawler characterized by forming the above-mentioned rubber slab object in the predetermined location of the above-mentioned rubber belt object in one body in claim 1 or a connecting linkage type rubber crawler given in 2.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] A portable type construction equipment etc. is equipped with this invention, and it relates to a suitable connecting linkage type rubber crawler.

[0002]

[Description of the Prior Art] Although the iron crawler is conventionally used for the portable type construction equipment chiefly, the rubber crawler is also being liked and used in recent years. Drawing 9 shows one example of the conventional iron crawler, these drawings A and B are sectional views of a cross direction and a hoop direction, respectively, and, for a shoe plate and 11b, a lug (iron) and T are [11 / a crawler shoe and 11a / a connection pin and R of a track link and p'] wheels in drawing. Drawing 10 shows one example of the conventional rubber crawler, these drawings A and B are a cross direction sectional view and a side elevation of a hoop direction, respectively, and, for 12, a rubber crawler and 12a are [rodging and S of a lug and 13] steel codes in drawing.

[0003]

[Problem(s) to be Solved by the Invention] Since the iron crawler excels [reinforcement / of the track link connected with the inner circumference side / connection] in endurance for the adult reason and there is neither elongation of a hoop direction nor a twist of a cross direction, a crawler blank has the advantages, such as being very few, but since a pavement road surface is damaged, even if a service space is limited and it makes a travel speed late comparatively, the noise is size, or since it is lacking in cushioning properties, fatigue of an operator has a fault, such as being large.

[0004] On the other hand, since a rubber crawler does not damage a road surface, it is used on the both sides of an urban area and the irregular ground. Although it has [that the noise is small in comparison] the advantage of a travel speed being brought forward and being able to raise working capacity since cushioning properties are good, it is good, and fatigue of an operator is small and a degree of comfort is also comparatively lightweight. It is that are extended to a hoop direction or produce a twist of a cross direction when endurance's being inferior to an iron crawler and impossible turning transit are carried out and too much tension arises, since a mechanical strength is inferior as a fault, and a crawler blank arises etc.

[0005] Drawing 11 is what shows one example of the connecting linkage type rubber crawler which this invention person indicated to JP,4-2582,A, JP,4-71386,A, etc. previously. As shown in drawing, while these drawings A and B are sectional views of a cross direction and a hoop direction, respectively, and attaching track-link T' in the both sides of center-section 15b of the rodging 15 laid under the interior of the rubber crawler 14 by bolt g' and nut g" each of each track-link T' -- ends are made to have connected by connection pin p' (14 in drawing a is a lug)

[0006] Since it becomes the configuration which the track link connected with the inner circumference side of a rubber crawler according to this drawing, it becomes what turns into what a twist of the elongation of a hoop direction and a horizontal cross direction does not produce like the above-mentioned iron crawler, and a crawler blank hardly generates. Moreover, although it becomes what

improved the fault of the conventional rubber crawler dramatically to become what was excellent in endurance etc. since the mechanical bonding strength of each link is size In addition, since it is an endless object, even if the activity with which crawler equipment is equipped is very troublesome or a part is damaged, there is a problem of having to exchange the whole. This invention indicates the connecting linkage type rubber crawler which is going to solve these troubles and was considered as the configuration still more convenient for the above-mentioned official report etc. than the thing of a publication.

[0007]

[Means for Solving the Problem] The description of the connecting linkage type rubber crawler of this invention is to consider as the configuration which attached the rubber slab object in each of this rodging vane through the rubber belt object which follows a hoop direction under the both-wings section of each rodging which carries out polymerization connection of the ends of each track link munually, and is arranged at fixed spacing under an endless object, nothing, and the connected this track link while attaching the track link for the iron crawlers of a couple in the upper part both sides of the center section of much rodging.

[0008] In order to **, and for the above-mentioned rodging to serve as the shape of the shape of flat, the made left right-wing section, and a cavity from the made center section mostly and to attach the above-mentioned track link in the both sides of this center section, For attaching a rubber slab object in each of the left right-wing section through the above-mentioned rubber belt object, each And nothing [which established installation means, such as a bolthole, / the configuration and nothing], Nothing [which formed installation means, such as a bolthole for attaching in the above-mentioned rodging vane, in the predetermined location while forming the above-mentioned rubber belt object in the die length which follows the hoop direction of the above-mentioned endless object as thin comparatively / the configuration and nothing], Nothing [which formed installation means, such as a bolthole for attaching in the above-mentioned rodging vane through the above-mentioned rubber belt object, in the top face while the above-mentioned rubber slab object formed the touch-down lug section caudad / the configuration and nothing], ** and installation association of each above-mentioned track link, rodging, a rubber belt object, and the rubber slab object is carried out in one with each installation means. It is good also as what considered as the configuration which equipped the both sides by the side of a periphery with the touch-down lug section arranged at fixed spacing while having the track link with which a couple follows the central both sides by the side of inner circumference, and formed the above-mentioned rubber slab object in the predetermined location of the above-mentioned rubber belt object in one body at this time.

[0009]

[Function] In the connecting linkage type rubber crawler of this invention In order to manufacture rodging, a rubber belt object, and a rubber slab object as respectively separate components, to assemble these to one body and to present an activity, Only the components damaged in this activity phase can be exchanged, the activity can be continued, and since it shall connect and attach by one or more places, in case a rubber belt object detaches and attaches a rubber crawler to crawler equipment, it can work, being able to remove this connection place.

[0010] Under the present circumstances, if the above-mentioned rubber belt object and a rubber slab object are used as long one-body-like cast, even if a production process will decrease, and it will be that the cost is cut down and it will set in this case, the endurance life of a rubber crawler can be made to extend as what excised and exchanges only the part into which the rubber slab object worn out especially was this worn out, attaches the rubber slab object of business, and continues an activity.

[0011]

[Example] Drawing 1 A-D is what shows 1 **** of rodging used by this invention. A A perspective view, B is X-X-ray sectional view of B, and a plan and C set a bottom view and D to drawing. 1 Rodging, The center section where a vane and 1b made the shape of a cavity in 1a, and p11 and p12 are boltholes. The bolts p11 and p11 prepared in the vanes 1a and 1a on either side are for attaching a below-mentioned rubber belt object and a below-mentioned rubber slab object in vane 1a. Moreover, the

boltholes p12 and p12 prepared in center-section 1b are for attaching the below-mentioned track link, and h is a level difference and has made center-section 1b the location lower than vane 1a. In addition, a bolthole spacing [in / in L11 / vane 1a], one a1, and one b1 are rodging reinforcing ribs, respectively. [0012] As drawing 2 A and B is the boltholes for [which shows one example of the rubber belt object used by this invention] being each a top view and a sectional view, and a rubber belt object and 2f being in agreement with a reinforcement code, and p2 making 2 in agreement with the bolthole p11 of the above-mentioned rodging vane 1a in drawing, and carrying out a bolt stop and is shown in drawing, a bolthole p2 and p2 -- are provided in the overall length of a pad object in rear-spring-supporter 2 train at fixed interval. In addition, reinforcement code 2f, it is for raising rigidity and if possible not elongating, and in this example, the cord fabric of fiber codes, such as nylon or Dacron, is used, it lays under the interior of the rubber belt object 2, and it is laid [a code object (warp) is lengthened and arranged and] under the longitudinal direction of the rubber belt object 2.

[0013] Although L21 and L22 are the bolthole spacings of the cross direction of the rubber belt object 2, and the die-length direction, respectively and the bolthole spacing L21 of a cross direction is made equal to the bolthole spacing L11 of the above-mentioned rodging vane 1a in this drawing The bolthole spacing L22 of the die-length direction considers as a dimension longer than this rodging spacing in order to incurvate the rubber belt object 2 highly and to make it follow an inner circumference side between rodging before and behind the hoop direction in the rubber crawler mentioned later. L23 and L24 are the width and die length of the rubber belt object 2, respectively, width L23 is made into the die length corresponding to the die length of the below-mentioned rubber slab object, and die length L24 will become quite longer than the circumference of a rubber crawler in order to incurvate the rubber belt object 2 between the above-mentioned rodging.

[0014] Drawing 3 A-D is what shows one example of the rubber slab object used by this invention. A is [a plan, and C and D of a perspective view and B] X-X-rays and the Y-Y line sectional views of B, respectively. In drawing in 3, a rubber slab object and 3a pars intermedia and 3c for a handle part and 3b The lug section, 3h is a horizontal cave, as shown in drawing, the handle parts 3a and 3a which incline and project on both sides of pars intermedia 3b made low one step are formed above the rubber slab object 3, and the lower part is set to lug section 3c used as a ground plane, and 3h of horizontal caves is prepared under the pars intermedia 3b. In addition, 3f and 3f are reinforcement codes which reinforce the perimeter of the top face of pars intermedia 3b, and 3h of horizontal caves, respectively, and the same cord fabric as the above-mentioned reinforcement code 2f is used by each in this example.

[0015] So that p3 may be a bolthole for attaching in the above-mentioned rodging vane 1a through the above-mentioned rubber belt object 2 in this drawing, 3h of horizontal caves may be made to have penetrated the bolthole p3 from the top face of pars intermedia 3b as shown in drawing and this installation may be mentioned later The corrosion plate and nut to the bolt inserted from the upper part are bound tight in bolthole p3 location of the head-lining side of 3h of horizontal caves. For this reason, 3h of horizontal caves is made into the thing of opening of magnitude which can perform this bolting, and the bolthole spacing L31 is made into the dimension equal to the bolthole spacing L11 of the above-mentioned rodging vane 1a, and the bolthole spacing L21 of the rubber belt object 2.

[0016] In addition, since the top face of the rubber slab object 3 is set to the acclivity side three a1 and three a1 towards both the handle parts 3a and 3a as shown in this drawing from pars intermedia 3b low one step, the rubber belt object 2 fixed to the upper part of the rubber slab object 3 so that it might mention later curves and follows a hoop direction along with an inclined plane three a1 and three a1.

[0017] Drawing 4 shows an example of the track link 4 used by this example, and A is a front view, B is a bottom view, and it is the same as what is used for the iron crawlers of the former part. The bolthole for attaching 4h of track links 4 in an aperture, and attaching p41 in the above-mentioned rodging center-section 1b in drawing, p42 is a pin hole for connection pins, and as shown in drawing, the pin hole p42 on either side and the p42 circumference are formed mutually in the right-and-left location at the thin-walled part (1/2 of thickness t). Connection of the track links which get mixed up by this is performed in the same thick condition. While making the both sides of this center-section 1b set up the track link of a couple by making the above-mentioned bolthole p41 and the bolthole p12 of each rodging

center-section 1b in agreement with this connection, and carrying out a bolt stop the wheel which was made to carry out a polymerization, inserts a connection pin in the condition which can be rotated, was made to connect each pin holes p42 and p42 of the track link of order, and -- between these pin holes that carried out the polymerization, and continued -- it considers as an orbit.

[0018] Drawing 5 is a thing explaining the process which assembles the connecting linkage type rubber crawler of this example. 5 in drawing and 5' is the bolthole by which a nut and 6 were prepared in the corrosion plate and a bolt, 5a, and 5'a prepared p6 in the corrosion plate 6. Make boltholes p41 and p12 in agreement [track links 4 and 4'] with the upper part both sides of rodding center-section 1b, respectively, and it is made to fix by the bolt 5 and nut 5a, as shown in drawing. Moreover, each bolthole p11, p2, p3, and p6 is made in agreement, and the rubber slab objects 3 and 3' which inserted the corrosion plate 6 are made to fix by bolt 5' and nut 5'a under the both-wings sections 1a and 1a in the rubber belt objects 2 and 2 and 3h of horizontal caves.

[0019] Drawing 6 A-C is what shows the connecting linkage type rubber crawler 7 which completed the above-mentioned assembly. A is a cross direction sectional view and B and C are Y1-Y1 line of A, and a Y2-Y2 line sectional view, respectively. Eight in drawing is a connection pin, as shown in drawing, connects each rodding 1 and 1', the track links 4 and 4' attached in --, and each of -- by the connection pin 8, and considers as the rubber crawler of an endless object. As a result, one pair of track links follow the central both sides by the side of the inner circumference of this endless object, and it becomes the configuration which the lug sections 3c and 3c' of the rubber slab object 3 and 3' are arranged at fixed spacing to the hoop direction in the periphery side. Furthermore, it becomes the configuration which the rubber belt object 2 curved highly to the inner circumference side between each rodding in the upper part (inner circumference side) of the rubber slab object 3, and followed the perimeter.

[0020] Since the rubber belt object 2 is following the perimeter in this example, while trespass of the earth and sand from the earth side to an inner circumference side is prevented. Since become what holds a suitable buoyancy also in the weak ground, and lowering of driving force is prevented, and the rubber belt object 2 curves highly to an inner circumference side between rodding and it becomes the same height as connection pin 8 location. It becomes what partial elongation does not produce on the rubber belt object 2 in the winding part to a sprocket or an idler, and internal distortion is not accumulated.

[0021] Moreover, since the rubber belt object 2 lays reinforcement code 2f underground and has made [rigid] it high as mentioned above. When a rubber crawler overcomes an obstruction in an irregular ground activity, even if a phenomenon which the upper limb of this obstruction thrusts up from the bottom in the rubber belt object 2 arises, it is extended locally or does not fracture. As reinforcement code 2f, other cord fabrics, plain weave fabrics, etc. of a fiber code of high intensity, such as nylon and Dacron, may be used, or code *****, such as these fiber codes, steel codes, etc., may be lengthened, arranged and laid underground. In addition, it is good also as a direction (the direction of bias) which may lay underground reinforcement code 2f more than two-layer, and is mutually different to a longitudinal direction in the direction of the code object of each class in this case.

[0022] On the other hand, have cushioning properties moderate since 3h of horizontal caves is established in the rubber slab object 3, and it becomes what has good riding comfortability. Moreover, it is one good also as a thing of construction material good also as the same thing as the above-mentioned reinforcement code 2f or with reinforcement lower than this, and in addition, reinforcement code 3f and 3'f which are laid under the rubber slab object 3 are laid underground more than two-layer, and are good for mutual also as a direction of bias.

[0023] However, it is one good also as a thing of the die length into which this invention is not limited to the above-mentioned example, and the above-mentioned rubber belt object divided the rubber crawler circumference suitably. In this case, it is made to carry out the polymerization of the edge of each rubber belt object of the divided this die length in a rodding vane location. With a rubber slab object, a bolt stop may be carried out and you may connect in this rodding vane location, and as the polymerization of this edge is carried out between rodding, up and down, through a suitable corrosion plate, a bolt stop may be carried out and you may connect in this location between rodding.

[0024] Moreover, what does not prepare a horizontal cave is sufficient as the above-mentioned rubber

slab object. In this case, drawing 7 is what shows mounting arrangement with this bolt make installation of a bolt into an option and another. Although each of A and B is the cross direction sectional views of the same location as drawing 3 D, a corrosion plate 6 and bolt 5' are laid under the interior of rubber slab object 3' in the example of A and a corrosion plate 6 is laid under the interior of rubber slab object 3" in the example of B Bolt 5' shall be inserted from the bolt insertion hole p30 which the corrosion plate 6 prepared caudad.

[0025] Drawing 8 is the side elevation showing another example of this invention. Nine in drawing A rubber crawler object, In 9a, the rubber belt section and 9b the rubber slab section and 9c the lug section and 9h A horizontal cave, p9 is a bolthole, and as shown in drawing, this example uses said rubber belt object 2 and rubber slab object 3 as long one-body-like cast. (B) is the fragmentary sectional view showing how to attach in rodding vane 1a, and (C) is a thing explaining how to exchange rubber slab section 9b. Rubber slab object 9'b for exchange which consumption of the lug section excises a lower part from X-X-ray in the especially intense rubber slab section, and shows to (D) as shown in drawing is attached.

[0026] According to this example, since a rubber belt object and a rubber slab object are made into one body, and the rubber slab section of the intense part of especially lug consumption can be exchanged and used even if a production process decreases, and it is that the cost is cut down and it sets in this case, in order to carry out vulcanization molding, the endurance of a rubber crawler has been improved.

[0027] In this invention, installation means, such as rodding, a track link and rodding and a rubber belt object, and a rubber slab object, are not limited to the approach by the bolt stop, and rodding and a track link may be combined by welding, for example, it does not interfere by the other approaches, either.

[0028]

[Effect of the Invention] According to the connecting linkage type rubber crawler of this invention, rodding, the rubber belt object, and the rubber slab object were manufactured as respectively separate components, it wrote as what can exchange only the components damaged in the activity phase as that with which assembles these and an activity is presented, and can continue an activity, and the endurance life of a rubber crawler became what is extended substantially. Moreover, the rubber belt object became what this connection place is written as what can remove and work as what is connected and attached by one or more places in case it detaches and attaches to crawler equipment, an attachment-and-detachment activity becomes very easy, and can do this activity in a short time.

[0029] When the above-mentioned rubber belt object and the rubber slab object were used as the long one-body-like cast at this time, even if the production process decreased, and it was that the cost is cut down and it set in this case, it was able to write as what excises and exchanges only the part into which the rubber slab section worn out especially was this worn out, attaches the rubber slab object of business, and continues an activity, and the endurance life of a rubber crawler was able to be extended.

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TECHNICAL FIELD

[Industrial Application] A portable type construction equipment etc. is equipped with this invention, and it relates to a suitable connecting linkage type rubber crawler.

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PRIOR ART

[Description of the Prior Art] Although the iron crawler is conventionally used for the portable type construction equipment chiefly, the rubber crawler is also being liked and used in recent years. Drawing 9 shows one example of the conventional iron crawler, these drawings A and B are sectional views of a cross direction and a hoop direction, respectively, and, for a shoe plate and 11b, a lug (iron) and T' are [11 / a crawler shoe and 11a / a connection pin and R of a track link and p'] wheels in drawing. Drawing 10 shows one example of the conventional rubber crawler, these drawings A and B are a cross direction sectional view and a side elevation of a hoop direction, respectively, and, for 12, a rubber crawler and 12a are [rodding and S of a lug and 13] steel codes in drawing.
[0003]

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EFFECT OF THE INVENTION

[Effect of the Invention] According to the connecting linkage type rubber crawler of this invention, rodding, the rubber belt object, and the rubber slab object were manufactured as respectively separate components, it wrote as what can exchange only the components damaged in the use phase as that with which assembles these and use is presented, and can continue use, and the endurance life of a rubber crawler became what is extended sharply. Moreover, the rubber belt object became what this connection place is written as what can remove and work as what is connected and attached by one or more places in case it detaches and attaches to crawler equipment, an attachment-and-detachment activity becomes very easy, and can do this activity in a short time.

[0029] When the above-mentioned rubber belt object and the rubber slab object were used as the long one-body-like cast at this time, even if the production process decreased, and it was that the cost is cut down and it set in this case, it was able to write as what excises and exchanges only the part into which the rubber slab section worn out especially was this worn out, attaches the rubber slab object of business, and continues use, and the endurance life of a rubber crawler was able to be extended.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] Since the iron crawler excels [reinforcement / of the track link connected with the inner circumference side / connection] in endurance for the adult reason and there is neither elongation of a hoop direction nor a twist of a cross direction, a crawler blank has the advantages, such as being very few, but since a pavement road surface is damaged, even if a service space is limited and it makes a travel speed late comparatively, the noise is size, or since it is lacking in cushioning properties, fatigue of an operator has a fault, such as being large.

[0004] On the other hand, since a rubber crawler does not damage a road surface, it is used on the both sides of a city area and the irregular ground. Although it has [that the noise is small in comparison] the advantage of a travel speed being brought forward and being able to raise working capacity since cushioning properties are good, it is good, and fatigue of an operator is small and a degree of comfort is also comparatively lightweight. It is that are extended to a hoop direction or produce a twist of a cross direction when endurance's being inferior to an iron crawler and impossible revolution transit are carried out and too much tension arises, since a mechanical strength is inferior as a fault, and a crawler blank arises etc.

[0005] Drawing 11 is what shows one example of the connecting linkage type rubber crawler which this invention person indicated to JP,4-2582,A, JP,4-71386,A, etc. previously. As shown in drawing, while these drawings A and B are sectional views of a cross direction and a hoop direction, respectively, and attaching track-link T' in the both sides of center-section 15b of the rodging 15 laid under the interior of the rubber crawler 14 by bolt g' and nut g" each of each track-link T' -- both ends are made to have connected by connection pin p' (14 in drawing a is a lug)

[0006] Since it becomes the configuration which the track link connected with the inner circumference side of a rubber crawler according to this drawing, It becomes what turns into what a twist of the elongation of a hoop direction and a horizontal cross direction does not produce like the above-mentioned iron crawler, and a crawler blank hardly generates. Moreover, although it becomes what greatly improved the fault of the conventional rubber crawler to become what was excellent in endurance etc. since the mechanical bonding strength of each link is size. In addition, since it is an endless object, even if the activity with which crawler equipment is equipped is very troublesome or a part is damaged, there is a problem of having to exchange the whole. This invention indicates the connecting linkage type rubber crawler which is going to solve these troubles and was considered as the configuration still more convenient for the above-mentioned official report etc. than the thing of a publication.

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MEANS

[Means for Solving the Problem] The description of the connecting linkage type rubber crawler of this invention is to consider as the configuration which attached the rubber slab object in each of this rodding vane through the rubber belt object which follows a hoop direction under the both-wings section of each rodging which carries out polymerization connection of the both ends of each track link mutually, and is arranged at fixed spacing under an endless object, nothing, and the connected this track link while attaching the track link for the iron crawlers of a pair in the upper part both sides of the center section of much rodging.

[0008] In order to **, and for the above-mentioned rodging to serve as the shape of the shape of flat, the made right-and-left vane, and a cavity from the made center section mostly and to attach the above-mentioned track link in the both sides of this center section, For attaching a rubber slab object in each of a right-and-left vane through the above-mentioned rubber belt object, each And nothing [which established installation means, such as a bolthole, / the configuration and nothing], Nothing [which formed installation means, such as a bolthole for attaching in the above-mentioned rodging vane, in the predetermined location while forming the above-mentioned rubber belt object in the die length which follows the hoop direction of the above-mentioned endless object as thin comparatively / the configuration and nothing], Nothing [which formed installation means, such as a bolthole for attaching in the above-mentioned rodging vane through the above-mentioned rubber belt object, in the top face while the above-mentioned rubber slab object formed the touch-down lug section caudad / the configuration and nothing]. **, and attach each above-mentioned track link, rodging, a rubber belt object, and a rubber slab object in one with each installation means, and it is made to join together. It is good also as what considered as the configuration which equipped the both sides by the side of a periphery with the touch-down lug section arranged at fixed spacing while having the track link with which a pair follows the central both sides by the side of inner circumference, and formed the above-mentioned rubber slab object in the predetermined location of the above-mentioned rubber belt object in one body at this time.

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OPERATION

[Function] In the connecting linkage type rubber crawler of this invention, In order to manufacture rodding, a rubber belt object, and a rubber slab object as respectively separate components, to assemble these to one body and to present use, Only the components damaged in this use phase can be exchanged, use can be continued, and since it shall connect and attach by one or more places, in case a rubber belt object detaches and attaches a rubber crawler to crawler equipment, it can work, being able to remove this connection place.

[0010] Under the present circumstances, if the above-mentioned rubber belt object and a rubber slab object are used as long one-body-like cast, even if a production process will decrease, and it will be that the cost is cut down and it will set in this case, the endurance life of a rubber crawler can be made to extend as what excised and exchanges only the part into which the rubber slab object worn out especially was this worn out, attaches the rubber slab object of business, and continues use.

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EXAMPLE

[Example] Drawing 1 A-D is what shows 1 *** of rodding used by this invention. A is a perspective view, B is X-X-ray sectional view of B, and a plan and C set a bottom view and D to drawing. 1 Rodding. The center section where a vane and 1b made the shape of a cavity in 1a, and p11 and p12 are boltholes. The bolts p11 and p11 prepared in the vanes 1a and 1a on either side are for attaching a below-mentioned rubber belt object and a below-mentioned rubber slab object in vane 1a. Moreover, the boltholes p12 and p12 prepared in center-section 1b are for attaching the below-mentioned track link, and h is a level difference and has made center-section 1b the location lower than vane 1a. In addition, a bolthole spacing [in / in L11 / vane 1a], one a1, and one b1 are rodding reinforcing ribs, respectively.

[0012] As drawing 2 A and B is the boltholes for [which shows one example of the rubber belt object used by this invention] being each a top view and a sectional view, and a rubber belt object and 2f being in agreement with a reinforcement code, and p2 making 2 in agreement with the bolthole p11 of the above-mentioned rodding vane 1a in drawing, and carrying out a bolt stop and is shown in drawing, a bolthole p2 and p2 -- are provided in fixed spacing in two trains covering the overall length of a pad object. In addition, reinforcement code 2f, it is for raising rigidity and if possible not elongating, and in this example, the cord fabric of fiber codes, such as nylon or Dacron, is used, it lays under the interior of the rubber belt object 2, and it is laid [a code object (warp) is lengthened and arranged and] under the longitudinal direction of the rubber belt object 2.

[0013] Although L21 and L22 are the bolthole spacings of the cross direction of the rubber belt object 2, and the die-length direction, respectively and the bolthole spacing L21 of a cross direction is made equal to the bolthole spacing L11 of the above-mentioned rodding vane 1a in this drawing The bolthole spacing L22 of the die-length direction considers as a dimension longer than this rodding spacing in order to incurvate the rubber belt object 2 highly and to make it follow an inner circumference side between rodding before and behind the hoop direction in the rubber crawler mentioned later. L23 and L24 are the width and die length of the rubber belt object 2, respectively, width L23 is made into the die length corresponding to the die length of the below-mentioned rubber slab object, and die length L24 will become quite longer than the perimeter of a rubber crawler in order to incurvate the rubber belt object 2 between the above-mentioned rodding.

[0014] Drawing 3 A-D is what shows one example of the rubber slab object used by this invention. A is [a plan, and C and D of a perspective view and B] X-X-rays and the Y-Y line sectional views of B, respectively. In drawing in 3, a rubber slab object and 3a pars intermedia and 3c for a handle part and 3b The lug section, 3h is a horizontal cave, as shown in drawing, the handle parts 3a and 3a which incline and project on both sides of pars intermedia 3b made low one step are formed above the rubber slab object 3, and the lower part is set to lug section 3c used as a ground plane, and 3h of horizontal caves is prepared under the pars intermedia 3b. In addition, 3f and 3f' are reinforcement codes which reinforce the perimeter of the top face of pars intermedia 3b, and 3h of horizontal caves, respectively, and the same cord fabric as the above-mentioned reinforcement code 2f is used by each in this example.

[0015] So that p3 may be a bolthole for attaching in the above-mentioned rodding vane 1a through the above-mentioned rubber belt object 2 in this drawing, 3h of horizontal caves may be made to have

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penetrated the bolthole p3 from the top face of pars intermedia 3b as shown in drawing and this installation may be mentioned later. The corrosion plate and nut to the bolt inserted from the upper part are bound tight in bolthole p3 location of the head-lining side of 3h of horizontal caves. For this reason, 3h of horizontal caves is made into the thing of opening of magnitude which can perform this bolting, and the bolthole spacing L31 is made into the dimension equal to the bolthole spacing L11 of the above-mentioned rodding vane 1a, and the bolthole spacing L21 of the rubber belt object 2.

[0016] In addition, since the top face of the rubber slab object 3 is set to the acclivity side three a1 and three a1 towards both the handle parts 3a and 3a as shown in this drawing from pars intermedia 3b low one step, the rubber belt object 2 fixed to the upper part of the rubber slab object 3 so that it might mention later curves and follows a hoop direction along with an inclined plane three a1 and three a1. [0017] Drawing 4 shows an example of the track link 4 used by this example, and A is a front view, B is a bottom view, and it is the same as what is used for the iron crawlers of the former part. The bolthole for attaching 4h of track links 4 in an aperture, and attaching p41 in the above-mentioned rodding center-section 1b in drawing, p42 is a pin hole for connection pins, and as shown in drawing, the pin hole p42 on either side and the p42 circumference are formed mutually in the right-and-left location at the thin-walled part (1/2 of thickness t). Connection of the track links which get mixed up by this is performed in the same thick condition. While making the both sides of this center-section 1b set up the track link of a pair by making the above-mentioned bolthole p41 and the bolthole p12 of each rodding center-section 1b in agreement with this connection, and carrying out a bolt stop the wheel which was made to carry out a polymerization, inserts a connection pin in the condition which can be rotated, was made to connect each pin holes p42 and p42 of the track link of order, and -- between these pin holes that carried out the polymerization, and continued -- it considers as an orbit.

[0018] Drawing 5 is a thing explaining the process which assembles the connecting linkage type rubber crawler of this example. 5 in drawing and 5' is the bolthole by which a nut and 6 were prepared in the corrosion plate and a bolt, 5a, and 5'a prepared p6 in the corrosion plate 6. Make boltholes p41 and p12 in agreement [track links 4 and 4] with the upper part both sides of rodding center-section 1b, respectively, and it is made to fix by the bolt 5 and nut 5a, as shown in drawing. Moreover, each bolthole p11, p2, p3, and p6 is made in agreement, and the rubber slab objects 3 and 3 which inserted the corrosion plate 6 are made to fix by bolt 5' and nut 5'a under the both-wings sections 1a and 1a in the rubber belt objects 2 and 2 and 3h of horizontal caves.

[0019] Drawing 6 A-C is what shows the connecting linkage type rubber crawler 7 which completed the above-mentioned assembly. A is a cross direction sectional view and B and C are Y1-Y1 line of A, and a Y2-Y2 line sectional view, respectively. Eight in drawing is a connection pin, as shown in drawing, connects each rodding 1 and 1, the track links 4 and 4 attached in --, and each of -- by the connection pin 8, and considers as the rubber crawler of an endless object. As a result, one pair of track links follow the central both sides by the side of the inner circumference of this endless object, and it becomes the configuration which the lug sections 3c and 3c of the rubber slab object 3 and -- arranged at fixed spacing to the hoop direction in the periphery side. Furthermore, it becomes the configuration which the rubber belt object 2 curved highly to the inner circumference side between each rodding in the upper part (inner circumference side) of the rubber slab object 3, and followed the perimeter.

[0020] Since the rubber belt object 2 is following the perimeter in this example, while invasion of the earth and sand from the earth side to an inner circumference side is prevented. Since become what holds a suitable buoyancy also in the weak ground, and the fall of driving force is prevented, and the rubber belt object 2 curves highly to an inner circumference side between rodding and it becomes the same height as connection pin 8 location, it becomes what partial elongation does not produce on the rubber belt object 2 in the winding part to a sprocket or an idler, and internal distortion is not accumulated.

[0021] Moreover, since the rubber belt object 2 lays reinforcement code 2f underground and has made [rigid] it high as mentioned above, When a rubber crawler overcomes an obstruction in an irregular ground activity, even if a phenomenon which the upper limb of this obstruction thrusts up from the bottom in the rubber belt object 2 arises, it is extended locally or does not fracture. As reinforcement code 2f, other cord fabrics, plain weave fabrics, etc. of a fiber code of high intensity, such as nylon and

Dacron, may be used, or code ****, such as these fiber codes, steel codes, etc., may be lengthened, arranged and laid underground. In addition, it is good also as a direction (the direction of bias) which may lay underground reinforcement code 2f more than two-layer, and is mutually different to a longitudinal direction in the direction of the code object of each class in this case.

[0022] On the other hand, have cushioning properties moderate since 3h of horizontal caves is established in the rubber slab object 3, and it becomes what has good riding comfortability. Moreover, it is one good also as a thing of the quality of the material good also as the same thing as the above-mentioned reinforcement code 2f or with reinforcement lower than this, and in addition, reinforcement code 3f and 3'f which are laid under the rubber slab object 3 are laid underground more than two-layer, and are good for mutual also as a direction of bias.

[0023] However, it is one good also as a thing of the die length into which this invention is not limited to the above-mentioned example, and the above-mentioned rubber belt object divided the rubber crawler perimeter suitably. In this case, it is made to carry out the polymerization of the edge of each rubber belt object of the divided this die length in a rodding vane location. With a rubber slab object, a bolt stop may be carried out and you may connect in this rodding vane location, and as the polymerization of this edge is carried out between rodding, up and down, through a suitable corrosion plate, a bolt stop may be carried out and you may connect in this location between rodding.

[0024] Moreover, what does not prepare a horizontal cave is sufficient as the above-mentioned rubber slab object. In this case, drawing 7 is what shows mounting arrangement with this bolt make installation of a bolt into an option and another. Although each of A and B is the cross direction sectional views of the same location as drawing 3 D, a corrosion plate 6 and bolt 5' are laid under the interior of rubber slab object 3' in the example of A and a corrosion plate 6 is laid under the interior of rubber slab object 3" in the example of B Bolt 5' shall be inserted from the bolt insertion hole p30 which the corrosion plate 6 prepared caudad.

[0025] Drawing 8 is the side elevation showing another example of this invention. Nine in drawing A rubber crawler object, In 9a, the rubber belt section and 9b the rubber slab section and 9c the lug section and 9h A horizontal cave, p9 is a bolthole, and as shown in drawing, this example uses said rubber belt object 2 and rubber slab object 3 as long one-body-like cast. (B) is the fragmentary sectional view showing how to attach in rodding vane 1a, and (C) is a thing explaining how to exchange rubber slab section 9b. Rubber slab object 9'b for exchange which consumption of the lug section excises a lower part from X-X-ray in the especially intense rubber slab section, and shows to (D) as shown in drawing is attached.

[0026] According to this example, since a rubber belt object and a rubber slab object are made into one body, and the rubber slab section of the intense part of especially lug consumption can be exchanged and used even if a production process decreases, and it is that the cost is cut down and it sets in this case, in order to carry out vulcanization molding, the endurance of a rubber crawler has been improved.

[0027] In this invention, installation means, such as rodding, a track link and rodding and a rubber belt object, and a rubber slab object, are not limited to the approach by the bolt stop, and rodding and a track link may be combined by welding, for example, it does not interfere by the other approaches, either.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] One example of rodding used by this invention is shown, and, for A, a perspective view and B are [a bottom view and D of a plan and C] X-X-ray sectional views of B.

[Drawing 2] One example of the rubber belt object used by this invention is shown, A is a top view and B is a sectional view.

[Drawing 3] One example of the rubber slab object used by this invention is shown, and A is [a plan, and C and D of a perspective view and B] X-X-rays and the Y-Y line sectional views of B.

[Drawing 4] One example of the track link used by this invention is shown, A is a front view and B is a bottom view.

[Drawing 5] Explain the process which assembles the example of the connecting linkage type rubber crawler of this invention.

[Drawing 6] The example of the connecting linkage type rubber crawler which completed the assembly like the assembler of drawing 5 is shown, A is a cross direction sectional view and B and C are Y1-Y1 line of A, and a Y2-Y2 line sectional view.

[Drawing 7] The example of the rubber slab object which does not prepare a horizontal cave is shown.

[Drawing 8] The example which made the rubber belt object and the rubber slab object with the long one-body-like cast is shown.

[Drawing 9] One example of the conventional iron crawler is shown.

[Drawing 10] One example of the conventional rubber crawler is shown.

[Drawing 11] this invention person shows one example of the connecting linkage type rubber crawler indicated previously.

[Description of Notations]

1 Rodding

1a Vane

1b Center section

2 Rubber Belt Object

2f, 3f, 3'f Reinforcement code

3, 3', 3" Rubber slab object

3a Handle part

Three a1 Inclined plane

3b Pars intermedia

3c, 9c Lug section

3h, 9h Horizontal cave

4 Track Link

4h Aperture

5 5' Bolt

5a, 5'a Nut

6 Corrosion Plate

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7 Connecting Linkage Type Rubber Crawler
8 Connection Pin
9 Rubber Crawler Object
9a Rubber belt object
9b Rubber slab object
Nine'b (for exchange) Rubber slab object
p11, p12, p2, p3, p41, p6 Bolthole
p42 Pin hole
h Level difference
L11, L21, L22, L31 Bolthole spacing
11 The Conventional Iron Crawler
12 The Conventional Rubber Crawler
13 15 Rodding
14 Connecting Linkage Type Rubber Crawler
R Wheel
T Track link
p' Connection pin
S Steel code

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